doubtnut
India's Number 1 Education App

MATHS

BOOKS - KAPLAN INC MATHS (ENGLISH)

FUNCTIONS

Example

1. If $f(x) = t^2 + \frac{3}{2}t$, then $f(q-1) =$

A. $q^2 - \frac{3}{2}$

B. $q^2 - \frac{1}{2}q$

C. $q^2 + \frac{1}{2}q + \frac{1}{2}$

D. $q^2 - \frac{1}{2}q - \frac{1}{2}$

Answer: D

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2. If $h(x) = \sqrt{x^2 + x - 4}$ and $g(x) = \sqrt{5x}$, what is the value of $h(g(6))$?

A. 5.48

B. 5.55

C. 5.61

D. 5.83

Answer: C

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3. What is the maximum value of $f(x) = 3 - (x - 2)^2$?

A. -3

B. -1

C. 1

D. 3

Answer: D

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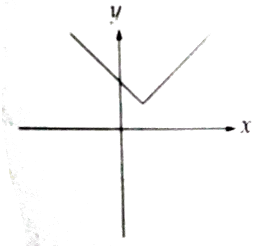
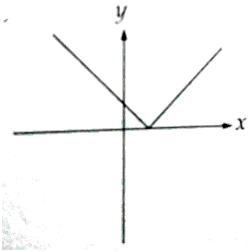
4. If $p(x) = |2 - x| + \frac{1}{2}$, which of the following could be the graph of $y = p(x)$?

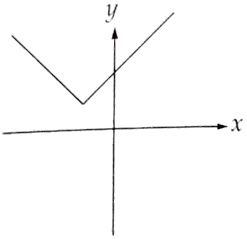
A.



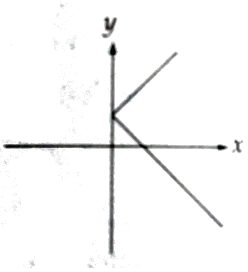
B.



C.



D.



Answer: A

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5. If $f(x) = \frac{\sqrt{x^2 - 4}}{x - 4}$, what are all the values of x for which f(x) is defined ?

A. All real numbers except 4

B. All real numbers except - 2 and 2

C. All real numbers greater than or equal to -2 and less than or equal to 2

D. All real numbers less than or equal to -2 or greater than or equal to 2, except 4

Answer: D

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6. If $f(x) = \frac{1}{3}x + 3$, then $f^{-1}(x) =$

A. $-\frac{1}{3}x - 3$

B. $-3x + \frac{1}{3}$

C. $3x + \frac{1}{3}$

D. $3x - 9$

Answer: D

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Functions Follow Up Test

1. If $f(x) = x^2 + 2x - 2$ and if $f(s-1) = 1$, what is the smallest possible value of s ?

A. -3

B. -2

C. -1

D. 1

Answer: B

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2. If $f(x) = 2x^3$ and $g(x) = 3x$, what is the value of $g(f(-2)) - f(g(-2))$?

A. -480

B. -384

C. 0

D. 384

Answer: D

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3. For what value of x is $\left|16-(x+5)^2\right|$ at its minimum ?

A. -9

B. -5

C. 5

D. 9

Answer: A

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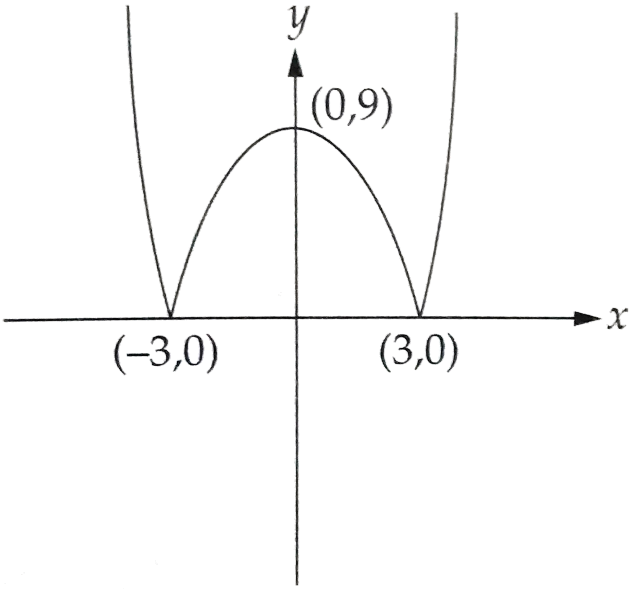
4. The graph in Figure could be the graph of which of the following functions ?



A. $f(x) = x^2 + 9$

B. $f(x) = (x - 9)^2$

C. $f(x) = 9 - x^2$

D. $f(x) = \left| -x^2 + 9 \right|$

Answer: D

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5. If $f(x) = \dfrac{1}{\sqrt{1 - x^2}}$, which of the following describes all the real values of x for which f(x)

is undefined ?

A. $x = -1$ or x = 1

B. $x < -1$ or $x > 1$

C. $x \leq -1$ or $x \geq 1$

D. $-1 < x < 1$

Answer: C

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6. If f(x) is a linear function and the slope of $y = f(x)$ is $\frac{1}{2}$, what is the slope of $y = f^{-1}(x)$?

A. -2

B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. 2

Answer: D

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Multiple Choice Question

1. If $f(x) = x^2 + 6$, what is the value of f(3)?

A. 15

B. 33

C. 39

D. 729

Answer: B

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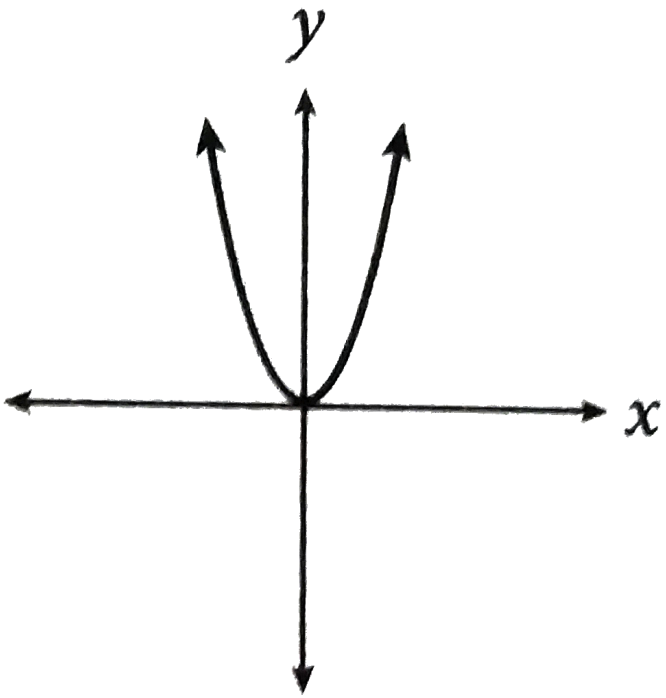
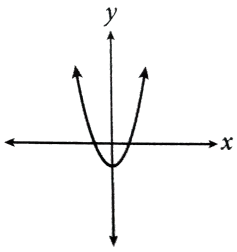


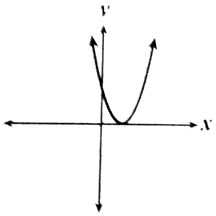
2.

If the above graph shows $f(x) = 7x^2$, which of the following is the graph of $f(x) = 7x^2 + 11$?

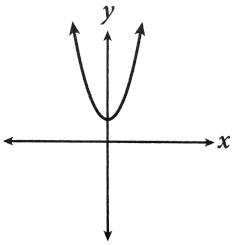
A.



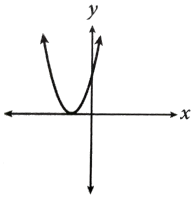
B.



C.



D.



Answer: C

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3. If g(x) respresents a quadratic function, which of the following best describes the relationship between the graphs of $g(x)$ and $g(x-3)$?

A. The graph of g(x-3) is 3 units to the left of the graph of g(x).

B. The graph of g(x-3) is 3 units to the right of the graph of g(x).

C. The graph of g(x-3) is 3 units lower than the graph of g(x).

D. The graph of g(x-3) is 3 units higher than the graph of g(x).

Answer: B

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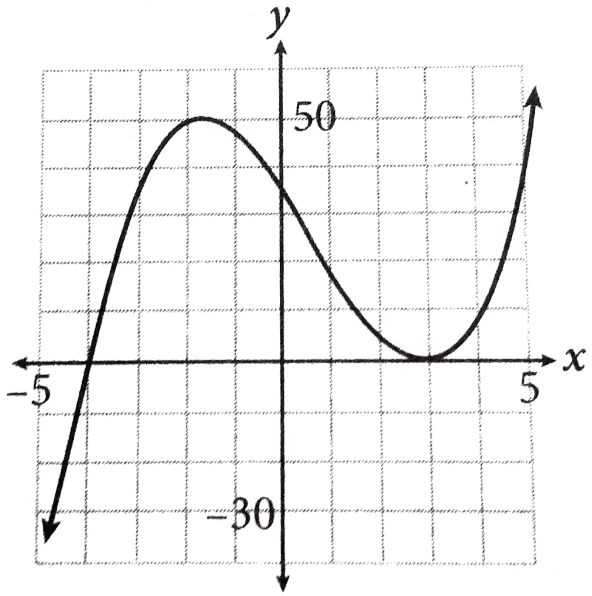
4.



If p(x) is the polynomial functions shown in the graph above, which of the following could be fractored form of p(x)?

A. $p(x) = (x - 4)(x + 3)$

B. $p(x) = (x - 4)(x + 3)^2$

C. $p(x) = (x+4)(x-3)$

D. $p(x) = (x+4)(x-3)^2$

Answer: D

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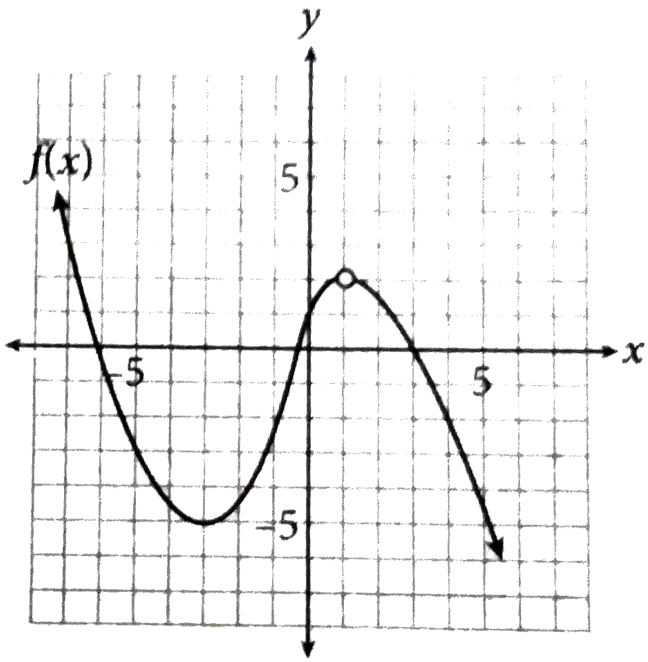

5.

The graph of y=f(x) is given above. For what value of x is y=f(x-4) undefined?

A. -3

B. 1

C. 2

D. 5

Answer: D

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6. If $f(x) = \left|x^2 + 2x + 1\right|$,what is the value of f(-4)?

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7. $f(s) = \frac{s}{25} + 1$

A collage compus has vending machines which must be peroidically restocked. The restocking frequency depends primarily on how many students have class near the machine each semester. The vending machine company uses the function shown above, where s is the number of students estimated too have classes within the immediate vicinity on a daily basis, to determine how many times per semester the machine must be restocked. How many more times must a vending machine

that has 400 students in the immediate vicinity be restocked compared to one that has 300 students in the immediate vicinity?

A. 2

B. 4

C. 7

D. 13

Answer: B

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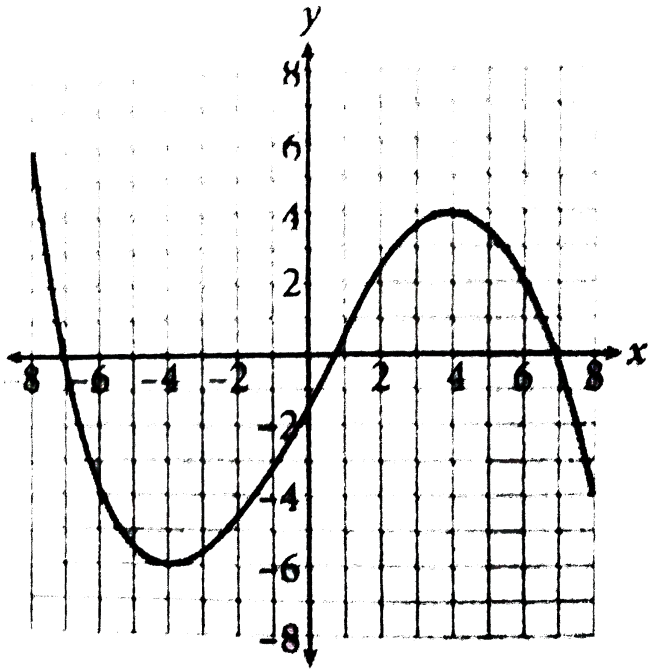

8.

What is the maximum value of the functions graphed on the coordinate plane above, over the interval $-8 \leq x \leq 8$?

A. 4

B. 6

C. 8

D. ∞(infinity)

Answer: B

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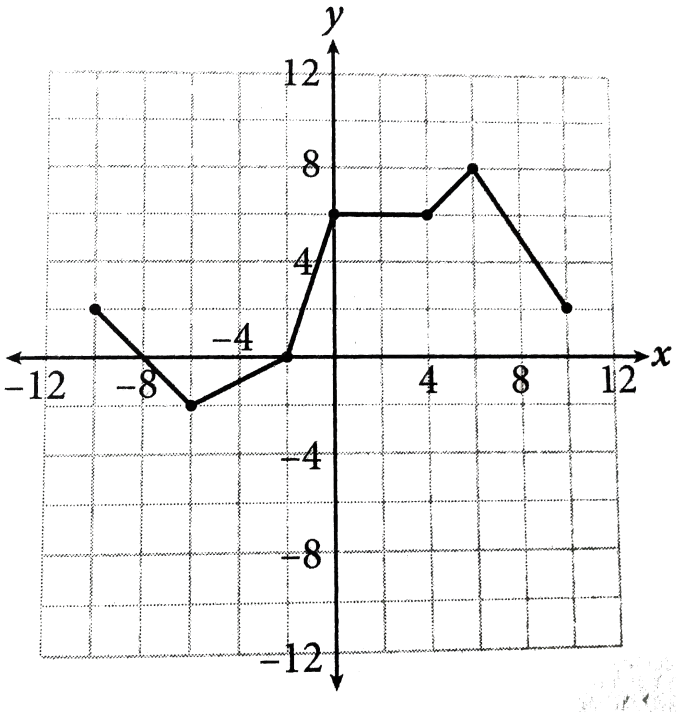

9.

The complete graph of the functions h is shown in the xy plane above. For what value of x is the value of h(x) at its maximum?

A. 5

B. 6

C. 8

D. 10

Answer: B

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10. $g(x) = \dfrac{x}{x-2}$ and $h(x) = \sqrt{9-x}$

Given of the following defined above, what is the value of $(g \circ h)(5)$?

A. 0

B. $\frac{8}{7}$

C. 2

D. Undefined

Answer: D

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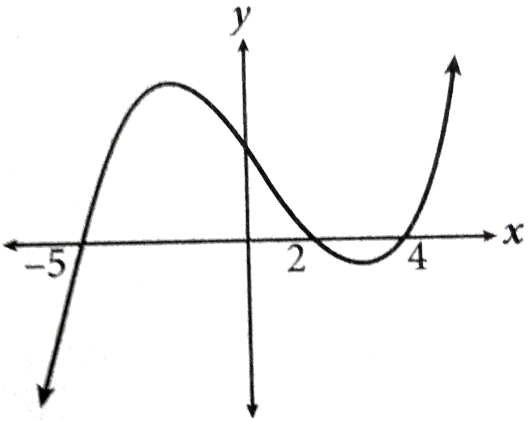
11. 

The polynomial function shown in the graph crosses the x-axis at $x = -5, x = 2$ and $x = 4$. If the equation for this polynomial is written in the form $y = ax^3 + bx^2 + cx + d$, with a=1, which of the following could be the equation?

A. $y = x^3 - x^2 - 38x - 40$

B. $y = x^3 + x^2 - 22x - 40$

C. $y = x^3 - x^2 - 22x + 40$

D. $y = x^3 + 5x^2 + 8x + 40$

Answer: C

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12. If $f(x) = \frac{1}{\sqrt{x}}$, what is the domain of f(x)?

A. All real numbers

B. All integers except zero

C. All positive real numbers

D. All real numbers except zero

Answer: C

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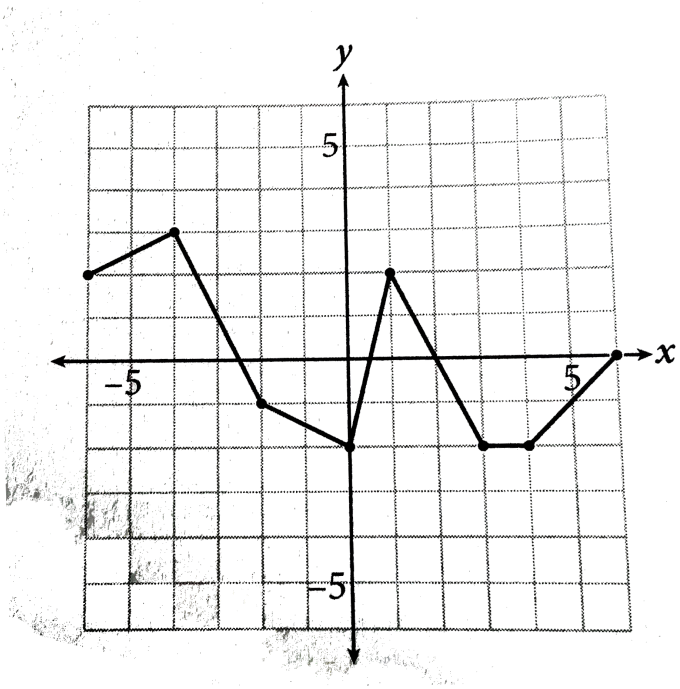
13.



The complete graph of the function f is shown in the xy plane above. Which of the following is/are equal to -2?

I.f(-1)

II.f(0)

III.$f\left(\frac{7}{2}\right)$

A. I only

B. II only

C. II and III only

D. I, II and III

Answer: C

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14. The polynomial function p is defined by $p(x) = 4x^3 + bx^2 + 41x + 12$, where b is a constant. When graphed on a standard

coordinate plane, p intersects the x-axis at $(-0.25, 0), (3, 0)$ and $(k, 0)$. What is the value of b?

A. -27

B. $-\sqrt{207}$

C. 4

D. 27

Answer: A

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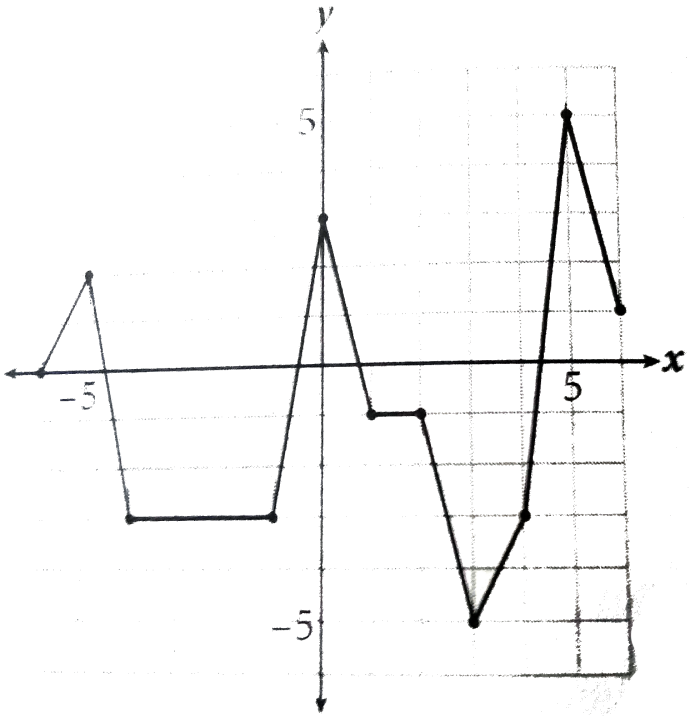

15.

The figure above shows the graph of h(x) on the interval $-6 \leq x \leq 6$. If h(3)=a, what is the value of h(a)?

A. -6

B. -5

C. 0

D. 2

Answer: D

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16. A function satisfies g(5)=3 and g(3)=0, and a function h satisfies h(3)=-2 and h(0)=5.What is the value of h(g(3))?

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17. If $f(x+2) = x^2 - x + 9$, then what is the value of f(-6)?

A. -47

B. 29

C. 65

D. 81

Answer: D

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18. If $g(x+3) = x^2 + 2x + 1$, then which of the following gives g(x)?

A. $g(x) = x^2 + 8x + 16$

B. $g(x) = x^2 - 4x + 4$

C. $g(x) = x^2 + 2x + 4$

D. $g(x) = x^2 + 2x - 2$

Answer: B

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19. A commercial airline has calculated that the approximately fuel mileage for its 600-passenger airplane is 0.2 miles per gallon when the plane travels at an average speed of 500 miles per hour. Flight 818's fuel tank has 42,000 gallons of fuel at the beginning of an international flight. If the plane travels at average speed of 500 miles per hour, which of the following functions f models the number of gallons of fuel remaining in the tank t hours after the flight begins?

A. $f(t) = 42,000 - \frac{500t}{0.2}$

B. $f(t) = 42,000 - \frac{0.2}{500t}$

C. $f(t) = \frac{42,000 - 500t}{0.2}$

D. $f(t) = \frac{42,000 - 0.2}{500t}$

Answer: A

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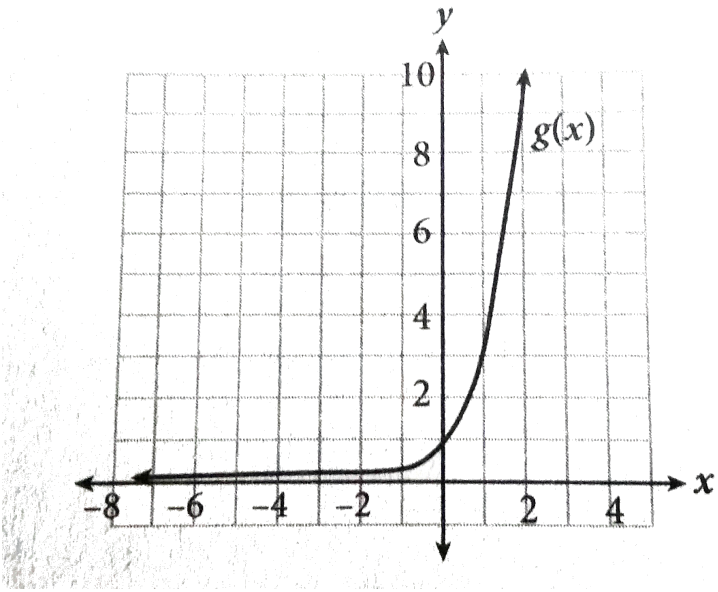
20. 

An exponential function g(x) is shown in the figure above. What is the exact value of g(-4)?

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